REMARKS/ARGUMENTS

Status of Application

Claims 1-8, 10-42, and 55-57 are pending. Claims 1-6, 8, 19, 23-30, 33-35, 39, and 55 were rejected; claims 7, 9-18, 21, 22, 31, 32, 36-38, and 40 were objected to; and claims 20, 41, and 42 were allowed. Applicant has amended claims 1, 7, 10, 13, 19-21, 29-33, 35-38, 40, and 55 to address various substantive and/or formal rejections of claims 1-6, 8, 19, 29, 30, 33-37, 39, and 55, and to eliminate unnecessary limitations from claims 1, 20, and 55.

Applicant has submitted a Terminal Disclaimer to address the obviousness-type double-patenting rejection of claims 23-28.

None of the amendments is believed to add new matter.

Telephone Interview of April 26, 2004

Applicant and Applicant's undersigned attorney wish to thank the Examiner for taking the time to discuss the outstanding rejection in a telephone interview on April 26, 2004. During the interview, claims 19 ("emissive coating") and claims 29 and 55 ("holding cantilever rigid") were discussed. Applicant undertook to work on the claim language that would better set forth the distinctions discussed.

With respect to claim 19, Applicant pointed out that an emissive coating emits its own light in response to a stimulus rather than merely transmitting light incident thereon. Specific examples of emissive coatings are recited in claims 20 (frequency doubling coating) and 23 (coating emits light in response to voltage).

With respect to claims 29 and 55, Applicant and the Examiner discussed U.S. Patent No. 5,338,932 to Theodore et al. (Theodore). Applicant pointed out that the subject application used the word "rigid" in the sense of fixed or set rather than Theodore's use of rigid in the sense of stiff or inflexible. Applicant also reiterated the deficiencies of Theodore set forth in the Amendment filed in response to the first substantive Office Action.

Claim Amendments

Amendments in Response to Objections to Claims 20, 35-37, and 40

The Examiner objected to claims 20, 35-37, and 40 for various informalities.

The objections to claim 20 appear to have been directed at claim 29, and Applicant has addressed those objections in amending the preamble of claim 29 to add missing words that were clear from the context. This is not believed to change the scope of the claim or add new matter.

Claims 35 has been amended to correct a dependency error. Claim 36 has been amended to correct the preamble to recite a method. Claims 36 and 37 have been amended to change the recited "said element" to "said member," and claim 36 has been amended to depend from claim 29 for consistency. These amendments are not believed to add new matter. The change from element to member is not believed to be a narrowing amendment since the terms mean essentially the same thing.

Claim 40 has been amended to move the "means for controlling said polarization means" so it occurs after the recitation of "polarization means." This is not believed to change the scope of the claim or add new matter.

A Broadening Amendment of Claims 1 and 55; New Claims 56 and 57

Although claims 1 and 55 are being amended as described below for the purpose of incorporating limitations from other claims or otherwise clarifying the language, claims 1 and 55 are also being amended to remove what is believed to be an unnecessary limitation. These claims formerly recited that the tip is "shaped to emit said provided light at said sharp end." However, these claims have been amended to recite that the tip is "shaped to emit light resulting from said provided light at said sharp end."

This amendment avoids any possible interpretation that the emitted light is limited to the provided light, that is, to light that is transmitted without modification through the sharp end of the tip. The specification describes at page 55, lines 9-31, and claims 19 and 20 (formerly dependent from claim 1) recite, the possibility of coatings that interact with the light and modify it. Claims 19 and 20, which are respectively drawn to an emissive coating and a

frequency-doubling coating, recite explicitly that the emitted light is light emitted by the coating..

Further, where claims 7 and 13 are said to incorporate the limitations of claim 1, it should be understood that they are incorporating the limitations of claim 1 with the broadening amendment.

New dependent claim 56 recites the situation where the emitted light is light that results from the provided light being transmitted through the tip, while new dependent claim 57 recites the situation where the emitted light is light emitted by a coating on the sharp end of the tip that results from an interaction between the provided light and the coating.

Amendment of Claims 1, 7, and 13

Claim 1 was rejected as anticipated by U.S. Patent No. 5,418,363 to Elings et al. and U.S. Patent No. 5,289,004 to Okada et al. (Okada).

Applicant has amended claim 1 (broadened as mentioned above) to incorporate the limitations of claim 9 (objected to), and has canceled claim 9. Therefore, amended claim 1 and its dependent claims 2-6, 8, and 10-12 are allowable.

Applicant has amended claim 7 (objected to) to incorporate the limitations of claims 1 (broadened as mentioned above), 5, and 6 (base claim and intervening claims). Therefore claim 7 is allowable.

Applicant has amended claim 13 (objected to) to incorporate the limitations of claim1 (base claim, broadened as mentioned above). Therefore, amended claim 13 and its dependent claims 14-18 are allowable.

Amendment of Claim 19

Claim 19 was rejected as anticipated by U.S. Patent No. 5,138,159 to Takase et al. (Takase). Applicant submits that Takase does not disclose an emissive coating over its core material at the sharp end of the tip as recited in claim 19. However, Applicant has amended claim 19 to more explicitly recite that the emissive coating emits light in response to the light provided to the tip. It is believed that this clarification clearly distinguishes a coating that merely transmits or reflects incident light.

Applicant has also amended claim 19 to re-arrange the recitation of the emissive coating to make clearer that it is the emitted light from the emissive coating rather than the provided light that interacts with the object.

Amendment of Claim 20

Applicant has also taken the opportunity to amend allowed claim 20 in two ways. First, Applicant has re-arranged the recitation of the frequency-doubling coating to make clearer that it is the emitted light from the frequency-doubling coating rather than the provided light that interacts with the object. Second, Applicant has broadened claim 20 by removing the language "said non-optical interaction being other than a tunneling current between said tip and said object." The now-removed language was added by amendment to claim 1 in response to the first Office Action, in which Office Action claim 20 was objected to. Applicant amended claim 20 to incorporate the limitations of claim 1, but unnecessarily included the language added to claim 1 in the same Amendment. Since that language was not required for allowability, Applicant is now taking the opportunity to remove it.

Amendment of Claims 29 and 55

Claim 29 has been rejected as anticipated by U.S. Patent No. 5,338,932 to Theodore et al. (Theodore). Claim 55 has been rejected as anticipated by U.S. Patent No. 5,289,004 to Takada et al. (Takada). Since claim 55 also recited "holding means for holding said cantilever rigid with respect to said base during said tunneling current mode," Applicant will treat the rejection as further in view of Theodore.

Applicant and the Examiner did not reach agreement regarding the distinction between Theodore's attempt to make the cantilever stiffer (more rigid in one meaning of "rigid") and Applicant's technique of making holding the cantilever fixed (rigid in another meaning of "rigid").

Applicant is currently amending claims 29 and 55 to recite immobilizing the tip. Applicant has chosen the terminology of "immobilizing" to resolve doubts about the intended meaning of "holding the cantilever rigid." This change is believed to be adequately supported in the application as files for the following reasons.

The term "immobilizes" appears twice in the specification as filed, once in the context of "the cantilever ... is immobilized and held rigidly against the clamping arm" and once in the context of "immobilizes (i.e., clamps) the cantilever." The particular passages are as follows:

- The heating elements 148 are responsive to the clamping arm movement signal and heat the action joints 146 so that the clamping arm 140 thermally expands at the action joints 146 and the free end 152 of the clamping arm 140 moves in and presses firmly against the free end 154 of the cantilever 130. As a result, the cantilever 130 in the STM mode is immobilized and held rigidly against the clamping arm 140 so that STM can be performed with tip 132, as will be described shortly. Page 8, lines 21-27.
- As a result, an attractive magnetic field is created which immobilizes (i.e., clamps) the cantilever 130. Page 10, lines 9-10.

Further, claim 31 as filed recited that the "cantilever has a free end adjacent to said tip" and recited "controlling movement of said free end of said clamping arm against said free end of said cantilever during said tunneling mode to hold said cantilever rigid with respect to said base."

CONCLUSION

In view of the foregoing, Applicant believes all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

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